CHAPTER 2

Safety and Compliance

This chapter contains important safety guidelines and compliance information that you should read before beginning installation of the MGX 8260 media gateway. For additional information, refer to Appendix B, “System Specifications”.

Warning **The MGX 8260 is intended for installation in restricted access areas. Only trained and qualified personnel should be allowed to install or replace this equipment.**

General Safety Recommendations

Follow these guidelines to help ensure your safety and protect the equipment.

- Install the MGX 8260 in compliance with national and local electrical codes. In the United States, the relevant code is National Fire Protection Association (NFPA) 70, United States National Electrical Code. In Canada, it is Canadian Electrical Code, part I, CC22.1. In other countries, you should observe the standards of the International Electrotechnical Commission (IEC) 364, Parts 1 through 7.
- Never attempt to lift an object that is too heavy for one person to lift alone.
- Always switch all power supplies off and disconnect all power cables before opening, installing, or removing a Cisco hardware shelf.
- Keep the area clear and dust free during and after installation.
- Keep tools and chassis components away from walk areas.
- Do not wear loose clothing, jewelry (including rings and chains), or other items that could become trapped in the chassis. Fasten your tie or scarf and roll up your sleeves.
- Be sure to operate the MGX 8260 in accordance with its marked electrical ratings and product usage instructions to guarantee safe operation.

Moving the Chassis

Review the following warnings before attempting installation of the MGX 8260.

Warning **Make sure that your rack is bolted to the floor before beginning installation of the MGX 8260 into the rack.**

Warning **Never attempt to lift a chassis by yourself. The size and weight of a chassis requires two people to lift and move it safely without causing injury or damaging the equipment. Ensure that your footing is solid, and balance the weight of the chassis between your feet. Lift the chassis slowly; never move suddenly or twist your body as you lift. Keep your back straight and lift with your legs, not your back. If you must bend down to lift the chassis, bend at the knees, not at the waist, to reduce the strain on your lower back muscles. Always disconnect all external cables before lifting or moving the chassis.**

Warning **To prevent bodily injury when mounting or servicing this unit in a rack, mount the MGX 8260 at the bottom of the rack if the rack will include only one MGX 8260 node. If mounting the MGX 8260 in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack. If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the MGX 8260 in the rack.**

Electrical Safety Warnings

Follow these basic guidelines when working with any electrical equipment:

- Disconnect all power and external cables before installing or removing a chassis, or before beginning any procedure that requires access to the chassis interior.
- Do not work alone when potentially hazardous conditions exist.
- Never assume that power has been disconnected from a circuit; always check.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.
- Never install equipment that appears damaged.
- Carefully examine your work area for possible hazards such as moist floors, ungrounded power extension cables, and missing safety grounds.

In addition, follow these guidelines when working with any equipment that is disconnected from a power source, but is still connected to telephone wiring or other network cabling.

- Never install telephone wiring during a lightning storm.
- Never touch noninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying telephone lines.

Warning **Only a DC power source that complies with the safety extra low voltage (SELV) requirements of UL 1950, CSA C22.2 No. 950-95, EN 60950, and IEC 60950 can be connected to an MGX 8260.**

Warning **The MGX 8260 is equipped with a DC power terminal block, and requires you to terminate the DC input wiring on a DC source capable of supplying up to 45 amps. Double-pole, 20-amp-per-pole, circuit breakers are required at the 48 VDC power source.**

Warning **The MGX 8260 metallic interface connections (T1/E1/DS3) must be connected to the network through registered or approved CSU/DSUs that provide necessary overvoltage and overcurrent protection per local and national codes and regulations (Telcordia GR-1089-CORE Type 2 products).**

Warning **Read the installation instructions before you connect the system to its power source.**

Warning **When carrying emergency (911) traffic, the MGX 8260 must be powered from redundant uninterruptible power sources.**

Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) damage occurs when electronic cards or components are improperly handled and can result in complete or intermittent system failures.

Use an antistatic strap (clipped to a grounded rack) whenever handling all cards.

To prevent ESD damage, follow these guidelines:

- Always use an ESD wrist strap or ankle strap and ensure that it makes good skin contact.

Caution For safety, periodically check the resistance value of the antistatic strap. The measurement should be between 1 and 10 Mohms.

- When handling circuit cards or cables, make sure the equipment end of your ESD strap is attached to an unfinished chassis surface of the device in which it is housed. Do not touch the printed circuit board, and avoid contact between the printed circuit board and your clothing.
- Always place circuit boards component-side up on an antistatic surface or in a static-shielding bag. If you are returning the item to the factory, immediately place it in a static-shielding bag.
- Ensure that all circuit cards are fully inserted into their respective chassis slots, the respective extraction levers are in the locked position, and the captive installation screws are hand tightened. The captive installation screws prevent accidental removal, provide proper grounding for the system, and help to seat the bus connectors in the receptacles.

Preventing Interference

When wires are run for any significant distance in an electromagnetic field, induced interference can distort the signals on the wires. The potential presence of interference has two implications for the construction of plant wiring:

- Poor wiring practice can result in radio interference.
- Strong electromagnetic interference (EMI), especially that caused by lightning, radio transmitters or induction start motors, can destroy the signal drivers and receivers in servers and controllers. EMI can even create an electrical hazard by conducting power line surges. For more information on the effects of EMI, review the safety guidelines in the "Preventing Electrostatic Discharge Damage" section on page 2-3.

Follow these guidelines to reduce the possibility of extraneous interference and damage from EMI pulses:

- Use twisted-pair cable in your plant wiring with good earthing distribution. If you must exceed the recommended wiring distances, use a high-quality twisted-pair cable with one ground conductor for each data signal.

Note Shielded twisted pair (STP) cabling must be used from the rear of the MGX 8260 to the demarcation point for all DS1 spans. Coaxial cable must be used from the rear of the MGX 8260 to the demarcation point for all DS3 spans.

- If wires exceed recommended distances or pass between buildings, consider the effect of a lightning strike in your vicinity. The electromagnetic pulse caused by lightning or other high-energy phenomena can easily couple enough energy into unshielded conductors to destroy electronic devices. If you have had problems of this sort in the past, consider consulting experts in electrical surge suppression and shielding.
- Use dedicated power circuits to feed each Cisco MGX 8260 node. If possible, avoid tapping master AC power feeds that also service high-current, motor-driven devices such as air conditioners or elevators.

Note Refer to the documentation shipped with the Cisco MGX 8260, as well as published interface and wiring standards for detailed requirements.

Note To predict and remedy strong EMI, you might also need to consult experts in radio frequency interference (RFI).

Equipment Location and Environmental Requirements

Proper location of the MGX 8260 chassis and careful layout of the equipment rack is essential for successful operation. Equipment placed too close together or inadequately ventilated can cause system overtemperature conditions. In addition, chassis panels made inaccessible by poor equipment placement can make system maintenance difficult. For environmental information pertaining to temperature, humidity, and altitude, refer to Table B-3 on page B-2.

Warning **To prevent chassis overheating, never install the Cisco MGX 8260 in a room that is not properly ventilated or air conditioned. For heat and other environmental specifications, refer to Appendix B, "System Specifications".**

Warning **Make sure that your equipment rack has the proper clearances and airflow to ensure adequate ventilation. Equipment near the bottom of the rack may generate excessive heat that is drawn upward and into the intake ports of equipment above, leading to overtemperature conditions in the chassis at or near the top of the rack.**

Note Allow clearance of 36 inches in front and behind the rack for maintenance and removal of equipment.

Cabling Considerations

Consider the equipment and cabling that is already installed in the rack. Ensure that cables from other equipment do not obstruct the airflow through the chassis or impair access to the power supplies or switching modules. Route cables away from field-replaceable components to avoid disconnecting cables unnecessarily when performing equipment maintenance or upgrades.

Caution To comply with FCC requirements, segregate the DC power cables from the signal and I/O cables. Route the signal and I/O cables vertically up or down the rear of the MGX 8260 chassis and route the DC power cables away from the signal and I/O cables.